

Application report

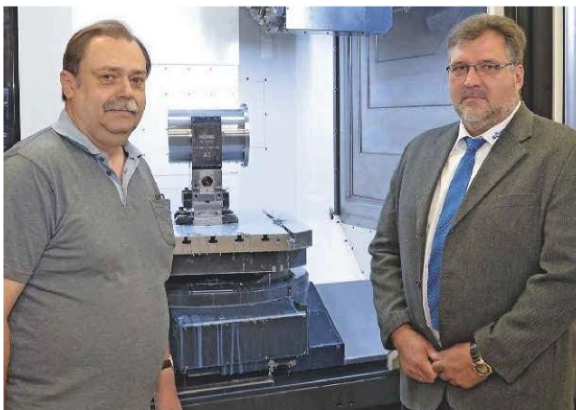
Spindle manufacturer relies on standard vice with unusual custom jaws

A sure grip on round items

GMN Paul Müller Industrie GmbH manufactures spindles for machine tools as custom manufacturing at the highest level. To do justice to this claim in its own manufacturing in Nuremberg as well, the manufacturing specialists rely on the long-lasting and precision clamping devices from RöhM.

Author: Frederick Rindle

So often, it is the small things in life that have the greatest effects. "What is the use of a high-precision 5-axis machining centre if the component does not sit on the machine correctly," says Erich Stecher. The experienced master in parts manufacturing at GMN Paul Müller Industrie GmbH in Nuremberg knows what he is talking about. "When setting up, everything must work so that the downtimes of the expensive machines can be kept as short as possible, and in addition we also have to carry over the precision to our components." In the process, the standards of the Nuremberg spindle manufacturer are not low by far: "The components are ultimately installed in our very powerful or quickly turning spindles," says Stecher.



The two experts are very satisfied with the clamping solution: Erich Stecher (left), master parts manufacturing, milling, GMN and Gerhard Häutle, technical sales consultant with RöhM

Contact and information:

Manufacturer:

RÖHM GmbH
Frank Heiler
Heinrich-RöhM-Str. 50
D-89567 Sontheim a.d. Brenz
Tel. +49 (0)7325 / 16 -364
f.heiler[at]roehm.biz
www.roehm.biz

RöhM Switzerland:

RöhM Spanntechnik AG
Damiano Casafina
CEO Switzerland
Feldstrasse 39
CH-3360 Herzogenbuchsee,
Tel.: +41 62 956 30 20

User:

IWC Schaffhausen
Christian Indlekofer
Manager of production for workpieces
Baumgartenstrasse 15
CH-8201 Schaffhausen
T: +41 (0)52 235 74 01
christian.indlekofer[at]iwc.com
www. iwc.com



With the new milling spindle of type "HCS 230 - 30000/150", it is possible to manufacture delicate and complex integral components economically, because the performance was improved by 25% with an unchanged design.

Picture: GMN

Founded in 1908, today GMN is in family hands and being managed in the fourth generation. Around 450 employees develop and manufacture high-precision ball bearings, sprag clutches, non-contact seals and also machine spindles exclusively at the company's headquarters in Nuremberg. This includes, for example, the new generation of higher performance milling spindles for high-volume machining of aluminium of the HCS 230 series. For the latest model of the series, the HCS 230 – 30000/150, the continuous output was raised from 120 to 150 kW. This provides speeds from 17,300 up to a maximum of 30,000 rpm achieving torque of up to 83 Nm. The spindle is equipped with an HSK-A63 tool holder with a contact face of 80 mm.

The high-performance spindles are delivered completely enclosed so that the machine manufacturer can install the spindles immediately and only has to flange-mount the connections. For the milling specialists, this results in a mainly round range of components with batch sizes of 1 to 10. "Our batches are mostly not much bigger, because the spindles are not used in mass products," says Stecher knowingly. "Therefore, we have to be able to react flexibly with our clamping devices to be able to reliably put the entire product range onto the machine."



Despite the very big overhang of around 284 millimetres, Röhmi can guarantee repeatability of one-hundredth of a millimetre and a clamping force of four tons with the NC-Compact centric vice of the RKZ series.

In use with flying colours for 15 years

The Nuremberg company has now relied on vices from Röhmi for more than 15 years. "We have already had six vices in use for years, and I can't remember that any have ever failed," emphasises Stecher. They are the NC-Compact centric vices of the RKZ series. The vices are distinguished by a very stable steel base body and a large clamping range. Furthermore, the vices that are optimised for 5-sided machining have high repeatability and constant clamping force. The average clamping accuracy is ± 0.01 mm with repeat clamping accuracy of 0.01 mm. The clamping thread of the spindle is protected against dirt and shavings in every position of the master jaw. As a series feature, the vice is equipped with stepped top jaws for components up to 180 mm.

"Our components can reach diameters of up to 280 millimetres. Therefore, it was clear that standard jaws would not suffice," says Stecher. They initially had a two-part round gripper made for the larger diameters. However, additional collars were required to be able to clamp all components with it. This clamping situation was too laborious for the milling specialists, on the one hand, and ultimately the quality was not satisfactory. We rely on high quality on the machine side as well for our precision manufacturing," says Stecher.

"Hence, a 5-axis DMC 100 U Duoblock milling centre from DMG with a GMN spindle is used in this case. The clamping devices must be able to keep up here."



The high-performance spindles at GMN are manufactured in batch sizes of 1 to 10.

Good experience with the manufacturer

Due to the many years of good experience, it was quickly clear that we would ask the manufacturer Röhm for a clamping solution for the big diameters as well. This was a real technological challenge to the responsible Röhm account manager Gerhard Häutle. "Having a customer who wanted to use our vices to clamp parts that were in those dimensions might come up every ten years. But our designers presented a solution very quickly in which, despite the large overhang of around 284 millimetres, the repeatability of one-hundredth and a clamping force of four tons could still be guaranteed." With two clamping sets in a prism shape, all diameters of initially 180 - 234 mm and with a second set from 234 - 281 mm could now be clamped reliably. In the process, the ground clamping bars provide the necessary precision, and the clamping jaws are still easy to change thanks to only having six screws per jaw.

"With the clamping jaws, we can react much more flexibly," says Stecher, "and in addition we also increased the precision of the components. That is because with the 3-sided machining that is now possible, we can completely machine our parts with just one clamping process. This has tremendous benefits, especially for the spindle sleeves. For example, hole patterns can be milled on the two end faces in one operation. Ultimately, we get considerably higher accuracy of the faces to each other."

GMN Paul Müller Industrie GmbH & Co. KG

www.gmn.de, AMB Hall 4 Booth C71

Röhm GmbH, www.roehm.biz

AMB Hall 1 Booth I12